

Lahontan Regional Water Quality Control Board

November 10, 2016

Lynda Deschambault
United States Environmental Protection Agency, Region 9
75 Hawthorne Street
San Francisco, CA 94105

COMMENTS ON ATLANTIC RICHFIELD COMPANY'S MINE WASTE TECHNICAL DATA SUMMARY REPORT, LEVIATHAN MINE SITE, ALPINE COUNTY, CALIFORNIA

Thank you for the opportunity to comment on Atlantic Richfield Company's April 23, 2016, *Mine Waste Technical Data Summary Report* for the Leviathan Mine Site. The California Regional Water Quality Control Board, Lahontan Region (Water Board) staff has the following comments:

1. General comments – How will data gaps related to Isbell Camp be addressed?
2. General comments – How will hot spots be addressed in this work plan for certain areas that have considerably higher concentrations than the mine waste in general? Hot spots with potential public access should be addressed separately per CERCLA guidance. The area near the Isbell Camp area that had a concentration of arsenic of 5526 mg/kg should be investigated as a hot spot. Why were the areas that had the highest arsenic concentrations from Phase 1 sampling not revisited during Phase 2 sampling?
3. Page 16, Section 4.1.2.1, first full paragraph on page, second to last sentence – It is unclear what the term “mechanically derived sediment in surface water” means. Please clarify.
4. Page 56, Section 6.2.1.3 – The linkage between metals groupings and the importance related to the Principal Component Analysis is missing in this section. It is unclear what the difference from the left-hand and right-hand side of the correlation circles represents and how the scales of spatial variation were determined. Please clarify.
5. Page 58 – 60, Section 6.2.2 Water Soluble RI/FS Metals Analysis – This section discusses the results from solubility testing using a DI WET test with deionized water. The statement that “Results for solubility testing such as the DI WET can be challenging to interpret because experimental setup does not represent

AMY L. HORNE, PhD, CHAIR | PATTY Z. KOUYOUMDJIAN, EXECUTIVE OFFICER

2501 Lake Tahoe Blvd., So. Lake Tahoe, CA 96150 | 15095 Amargosa Road, Bldg 2, Ste 210, Victorville CA 92394
e-mail Lahontan@waterboards.ca.gov | website www.waterboards.ca.gov/lahontan

environmental conditions”, leads to concerns with the applicability of this testing procedure. In reviewing EPA email comments from November 3, 2014, it appears that most of what was requested by EPA is not included in this document, specifically:

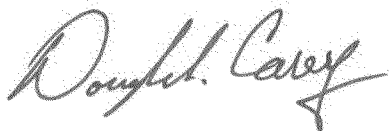
- Please include a more thorough discussion on why solubility data from deionized water extractions is useful for predicting groundwater leaching risks, specifically, why the extraction method is representative of in-situ conditions.
- The plan suggests that metals and acid generating material may not coincide. Specific aspects of the procedure for extraction should be discussed for in-situ geochemical relevance; this discussion should include pH of the extraction fluid, ratio of extraction fluid to sample material, and amount of exposure time of the extraction fluid to sample material.
- If there is a plan to check reasonableness of the metals leaching to groundwater predictions, e.g. pore water sampling after it rains, please discuss.

The larger question of applicability of the DI WET test method with deionized water is still in question, and there is insufficient information and discussion in this document to answer these continuing issues. Please clarify.

6. Page 67, Section 6.4.1.7, entire section, and Page 87, Section 9, first bullet on page – The first paragraph of Section 6.4.1.7 discusses that there are previous studies documenting aluminum concentrations that could limit plant growth. Later in the third paragraph of this section, there is a statement that concentrations from borehole data indicate 11 metals have the potential to be phytotoxic, which includes aluminum. However in Section 9, the bullet summarizes that “there appears to be no specific micro-nutrient metal concentrations that might cause phytotoxic effects on revegetation efforts at the site” and there is no mention of aluminum. It is unclear what is supporting this conclusion in light of the previous statements, and the conclusion could be misleading. Please clarify.
7. Page 82, Section 8.4.2.1 – Please explain the basis for the conclusion that human receptors could not be exposed to the maximum concentration of all COPCs and the assumption that they would be exposed to average conditions throughout. Does this mean that there are no instances where a human receptor could be exposed to a maximum concentration of COPCs?
8. Page 83, Section 8.4.3.1, second paragraph – Please explain the basis for using an Exposure Point Concentration (EPC) calculated as the 95 percent upper confidence limit of the mean to estimate the reasonable maximum exposure scenario for each exposure area. It appears that this EPC could underestimate potential maximum exposures when the maximum concentrations of each metal were approximately 2-15 times higher than the EPC as shown in Table 8-11. Further, it is unclear if the EPC included or excluded the outliers identified in Table 8-13, which would also reduce the metals concentrations.

9. Page 83, Section 8.4.3.1, second paragraph and Table 8-13 – It appears that an evaluation was conducted on the ten highest concentrations of each metal to determine if they could be considered outliers. For seven metals it was determined that the top 10 concentrations were outliers of which some outliers were 10 times the representative concentration. Please explain how these higher concentrations were determined to be outliers versus hot spots. This data should be carefully evaluated to ensure that valid high concentration data points are not inadvertently removed. Are the same 10 outliers identified for the seven metals from the same sample locations? The sample locations for these potential outliers should be identified and illustrated in this document.
10. Page 83, Section 8.4.3.1, third paragraph – Why is further analysis only recommended for hot spot areas if the risk analysis does not indicate potential human health risks greater than acceptable levels? There are areas that appeared to be hot spots during Phase 1 sampling that were not sampled during Phase 2. If these areas are more likely to be accessed by humans, it may be appropriate or necessary to conduct additional hot spot sampling to evaluate exposure separately for certain areas. Please explain the basis for this determination.
11. Appendix 5-C, Appendix 5-F, and Appendix 5-G – It appears that there is missing information in these appendices. The variograms do not include what metal is being modeled, there are no descriptions to assist the reader in understanding what is being shown (such as in Appendix 6-A, page 534 of 803 or slide 31 of October 2, 2014 presentation), and there are no ranges specified on any of the variograms.
12. Appendix 5-H – It appears that there is missing information in this appendix. It is not clear what metal is displayed in the cross validation plots and the information that is being displayed is not defined in a manner to understand the importance of this analysis.

If you have any questions regarding these comments, please contact Hannah Schembri, Water Resource Control Engineer at hannah.schembri@waterboards.ca.gov or (530) 542-5423, or me at douglas.carey@waterboards.ca.gov or (530) 542-5468.



Douglas Carey, P.G.
Senior Engineering Geologist, Leviathan Mine